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ABSTRACT

This case study uses interpretive methodology to investigate the development of an exemplary high school teacher's practical instructional representations. Findings indicate that the teacher's instructional representations evolved through a cycle of comprehension, planning and preparation, teaching, evaluation, and reflection. The instructional representations were influenced by personal disposition and style, other teachers' personal experiences, beliefs about teaching and learning, classroom management, scientific epistemology, knowledge of teaching materials, evaluation, the teaching context, and constraints. (JRH)

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ED 406 215

An Interpretive Study on Instructional Representations of a Senior High School Biology Teacher

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This case study investigate the development process - meaning and affecting factors of practical instructional representations of a high school exemplary biology teacher. With the interpretive research methodology, the result of this study reveals the case teacher's instructional representations involvesd a cycle through the activity of : comprehention, planning and preparation, teaching situation, and evaluation and reflection . Subjects teaching and learning direction and approach enriched the instructional representations . The case teacher's instructional representations were under the influence of personal diposition and style, his respected teacher, accumulating of experiences in learning and teaching , in addition to the beliefs on teaching ,on students' learning, on classroom management, on scientific epistemology, and the practical knowledge of teaching materials, the object of teaching, evaluation, teaching context , and constraints . Finally,, "Logical-Structual World View" explore the case teacher's instructional representations. The world view developed by the case instructor closely mimic and interact with his instructional representations and its impact on fellow students.

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I . Instruction and purpose of the study

The instructional representation is the observational behavior that the teacher use to help students to construct the subject matter knowledge ." Use of a representational repertoire which includes analogies, metaphores, examples, demonstrations, explanations , ans so forth." (Shulman , 1987) . The exemplary case teacher(Mr. Chao) demonstrated multiple and complex instructional representations . Forms of instructional representation employed included analogy, metaphore, functios, example, rationality, definition, genetic, practical operation, mechanical, clarity, tautological, encourage and remind, question and answer guidance, discussion, manipulation and example practice, along with the aid of vivid voice, poise ,and colorful pictures. Furthermore, these all impact on students and enhances their learing and appreciation of instructional representations firsthand, and had positive feeling, desirabole achivement, and created harmonious climate. So, all of these things creatived the purpose of the study:

a、Probe the the development process of instructional representations of the case teacher.

b、Explore the meaning of instructional representations of the case teacher.

c、Investigate factors affecting instructional representations of the case teacher.

II .Research Methodology

A . Data collection and Analysis

The subject of this interpretive research study is a High School Biology Teacher, Mr. Chao. He has had thirty years of teaching experience before the conduction of the research. The research data consist of classroom observation and full length video and tape recording of 27 class sessions of Mr.Chao's 10th and 12th grade classes, studen questionaire, and one to one student interview. The combination of field note, recorded class sessions nad transcription, and the student interviews formed the backbone of the interview content with Mrs. Chao.

The classroom observations and the interviews formed preliminary fiding for this study. For example , observation fidings are immediately jotted down during the on site observation, listing out the incidents that might have contributed to Mr. Chao's instructional and personal protocol . These combined with the Constant Comparison Method (Strauss and Cobin, 1990) to develop into the preliminary fidings. This coupled with the Triangulation process to determine the validity of the fiding. The process is repeated over until hard finding is developed and tested.

B. Data Interpretation and Analysis Theory

The data interpretation and analysis is based from the Kearney's 1984 Logico-Structual World View Theory and The Dialetical Development and Evoluation of a World View (Cobern, 1991). The combined use of World View theory with this study's findings heightened validity of the findings and provides a deeper thoughts and also grand views to the study.

III Research Findings

A. Subject Teacher's Evolution of Instructional Representations

Assertion: Mr. Chao's instructional representations developed from comprehention, planning and preparation, teaching situation and evaluation and reflection.

Finding 1: Mr. Chao's instructional representations developed from comprehention, logistic planning and preparation first.

Mr. Chao's instructional representation is formed preliminarily from his knowledge of subject, thorough planning of tesching direction,and preparation of clsass session.

T: I always organize my materials before the class sessions, especially the materials pertaining most to that particular sessions' topic. I have an extensive collection of non-native materials to aid in class lectures. (0916TINT)

Finding 2: Mr. Chao's instructional representations test through instruction.

Mr. Chao gets immediate responses and feedback of his actual teaching session and his instructional representations from the students interaction in class and students critique either during or after the class sessions.

T: I have been in teaching for almost 30 years, I can tell student's learning process and result simply from their in class reaction. (0916INT)

Finding 3: Mr. Chao's final step in developing his instructional representation is self evaluation and reflection.

Mr. Chao incorporate the his teaching behavior, class environment and situation, and students' learning response and feedback to evaluate his own appropriateness in the use of that session's teaching approach and materials.

T: I always evaluate and re-evaluate my approaches. When I find if a subject is not interpreted effectively to the student to provide maximum learning. I will find the source of the problems immediately and corrected it to make sure the problem dose not persist for the next class sessions. (1102TINT4)

B. Subject's Instructional Representation and its Meaning

Assertion 2 : Subjects teaching and learning direction and approach enriched the instructional representation.

Finding 4 : Analogy and Metaphore are employed to clarify the abstract Biology concept.

T: Analogy and Metaphore can facilitate students learning , enhance memory retention, and raise students' interest on tne subject. (0916TINT1)

Finding 5 : Clarity, Class material correction and additional explanation are to rectify students' misconception of the class subjects before and after the lecture.

T: Pertaining to students' misconception and the correction process for the misconception. I will raise multiple examples to help them understand the subjects and point out the mistakes the textbooks have made. (0115TINT6)

Finding 6 : Genetic is for the students to understand every process of change of evolution that are significant to the Biological Science.

T: History of Science is very important. We can learn from tne failure, discard the misconception and accepting the new finding or the findings that are most closet to the truth. (0115TINT)

Finding 7 : Practical operation helps students to grasp the ideas accurately and deeply in mind.

T: We can enhance the effectiveness of learning by encouraging student's phical participation in exercise and in mind. For example, we can use Interactive videos, models of brain and so on. (0916TINT1)

Finding 8 : Tautological is for memory retention and decreasing the load for the students.

T: It has been said in the chinese that the best way to learn is to repeat, repeat and repest the material. Get to know the materials well will decrease the time to review in the future.(0124TINT7)

Finding 9 : Encouragement and reminder is the first step toward students' interest and motivate them in studying the subjest.

T: Encouragement enhances the accomplishment satisfaction for students, and they would be more actively participating in the future. (1102TINT4)

Finding 10: Diagrams can simplify complicated or abstract biology drawing , and can make it be easier to annotate, lecture, and understand.

T: I can draw and diagram with various colors. This way the student is more interested and easier to understand. With various level of color constrast, students' memory retention is longer and more durable. (1011TINT3)

Ⅲ. Influences of the Research Subject's Instructional Representations

Assertion 3 : Mr. Chao's multi-sided beliefs and knowledge formed his diversifed instructional representations.

Finding 11: The most influential belief that constructed Chao's instructional representations derived mainly from his belief to the teaching , belief for the student learning ,belief of the classroom management and belief of the nature of scientific knowledge .

Mr. Chao's belief in teaching is a teaching of confidence. He thought that the purpose of learning was reconstructing knowledge, remodeling mind to kindness. He also thought that the learning of student was the responsibility of both teacher and student.

T: .... learning itself in fact was remodeling one's mind; learning also was a construction, agressive learning could make evil to kindness....., this is the most important destination of learning. (1102TINT4)

Mr. Chao emphasize the biological knowledge and daily activity's connection, reduced the pressure to student as could as possible. Furthermore he induced the student's motivation in learning, and the same time also promote the whole classroom's learning activity.

T: no particulary care the order of classroom but let students paid attention was the most important thing,..... if you could make students pay attention to listen,

then the atmosphere of the classroom will be very harmonic and wonderful. (1102TINT4)

Finding12: The most influential practical knowledge that constructed Chao's instructional representations derived mainly from his practical knowledge of teaching materials, the object of teaching , evaluation , teaching contex , and constraints.

Chiao thought that local published textbooks had their advantage and disadvantage; the foreign published textbooks-- especially published in U.S.A had more thoroughly editation, so he had many ideas was come from these books. So these books had profounded effects on his teaching. He also thought that differit grades should had defferent teaching expectation, so he expressed different forms of teaching between different grades. On the other hand, the teaching schedule, every test and the teaching tools were the limitation of his teaching. Furthermore, the profound konwledge of his ablilty also made the limitation of student's learning.

T: my teaching limitation was could not teach as much as I wish.(1011TINT3)

Finding 13: The personal characters, respected teacher, learning experiences and teaching experiences come into the practical knowledge and belief in biological teaching.

T: I had type A characters, so because of profounded preparation that very few mistakens was made in my thirty years long teaching career. Just because of preparation beforehand .(0916TINT1)

T: my primary school teacher Huang effect me a lot. (0930TINT2)

Ⅳ. Conclution

A. "Logical-Structual World View" explore the case teacher's instructional representations : This theory attempt to clarify the interactions between self (the teacher) and non-self (the students, student parents, teaching context and so on) by five categories: classification, relationships, causality, time and space.

B. "The Dialetical Development and Evoluation of a World View" explore the case teacher's instructional representations : Mr. Chao's instructional representations were under the influence of personal disposition, respected teacher, accumulating of experiences in learning and teaching , in addition to the beliefs and practical knowledge . These have an effect on the process and the meaning of the instructional representations , and impact on fellow students（see Figure1）.

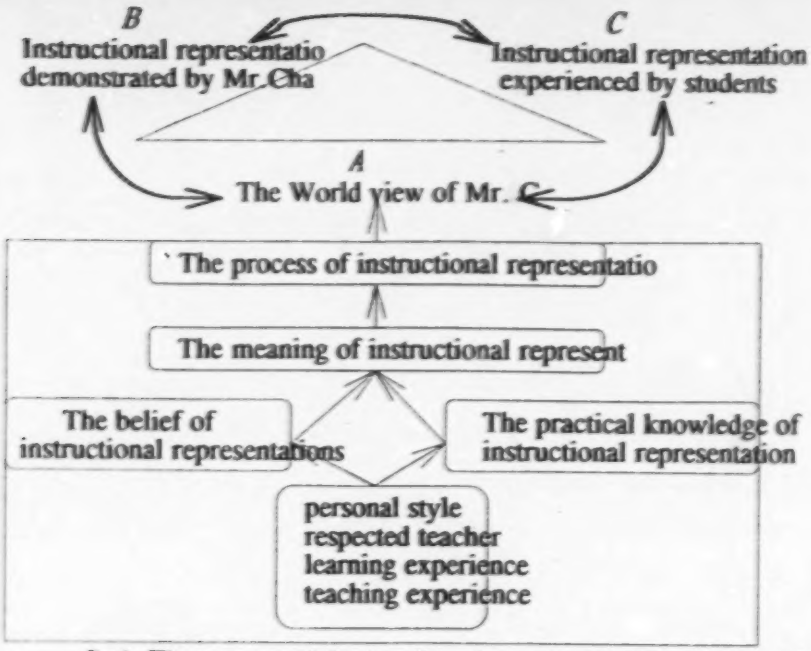

fig1. The scope of instructional representations of Mr. Chao

V. Implications

1. Inspiration to scientific teachers:

Mr. Chao still keep learning although he had teaching experience of thirty years, this worth learning . This paper also revealed that scientific teachers must have the ablity to self-analysis to create ones own world view in teaching and learning.

2. Inspiration to biological teachers:

Mr. Chao could see things in student's point of view, understanding students and realized student's biological basic knowledge, make the teaching tool practically and vitally to induce student's motivation in learning to make his teaching activity successfully. This stratergy worth learning.

3. The inspiration in instructional representations research:

"Dagher & cossman(1990) reported on an qualitive study of explanations used by junior high science teacher... In their concluding remarks,the researchers noted that in future studies interviewing the teachers would provide important contextual information concerning the use of explanation types..... They did not use an a priori classification system, nor did they consider their study to the world view related."(Cobern,1991) . My research was based on practical classroom observation and teacher-student conversation to study the teaching representation and its inclusion, effecting factors. So it could make up the previous researching defects.